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March 3, 2017

Arthur Burbank
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Forest Service Intermountain Region
4350 South Cliffs Drive
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Subject: **Smoky Canyon Mine Remedial Investigation/Feasibility Study (RI/FS)**
Simplot Responses to Additional Agency Comments #2 on
Draft Phase 2 Pilot Study Work Plan and SAP
Ultra-Filtration/Reverse Osmosis and Biological Selenium Removal
Fluidized Bed Bioreactor Treatment Technology

Dear Art,

This submittal provides J.R. Simplot Company responses to the Additional Agency Comments #2 (February 24, 2017) on the Draft Phase 2 Pilot Study Work Plan and Sampling and Analysis Plan, Ultra-Filtration/Reverse Osmosis and Biological Selenium Removal Fluidized Bed Bioreactor Treatment Technology. We appreciate your prompt processing and review of these responses.

As we finalize construction and prepare to commission the Phase 2 study, we ask you to expedite your review and approval process for these additional responses and if possible review them within the review timeframe of the previously submitted responses on January 30, 2017.

Please contact me if you have any questions or comments on this submittal.

Sincerely,

Jeffrey Hamilton
Environmental Engineer

Enclosures

cc: Arthur Burbank – USDA Forest Service, 410 East Hooper, Soda Springs, ID 83276 (2 copies)
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Simplot Responses to Additional Agency Comments #2 (February 24, 2017) on the "Draft Phase 2 Pilot Study Work Plan and Sampling and Analysis Plan Ultra-Filtration/Reverse Osmosis and Biological Selenium Removal Fluidized Bed Bioreactor Treatment Technology" (October 2016)

Additional Specific Comments #2 (February 24, 2017):

AC-1 ***Table 3-1, Page 17:*** *Table 3-1 also indicates that effluent total Se range is anticipated to be ≤ 7µg/l (which is higher than the WQC), and it's stated in a footnote that this assumes "95 percent removal of total selenium, with maximum influent total selenium concentration of 125 µg/l". The pilot data presents a maximum concentration higher than 125 µg/l and the removal rate was also higher at ≤ 10 µg/l (average was ~ 8 µg/l). 95% removal efficiency of the pilot, using the average influent concentration of 125 µg/l would provide a concentration of 6.25 µg/l; 95% of the maximum in the pilot (140 µg/l) would be 7 µg/l. On Page 15, it is stated that the RO will concentrate Se at a 4 to 1 ratio. If the maximum concentration is 140 µg/l, a 4 times concentrate would be 560 µg/l. The pilot FBR efficiency ranged from 93% (maximum 10 µg/l in effluent assuming maximum influent 140 µg/l) to 96% (minimum 5 µg/l in effluent assuming maximum influent 140 µg/l); using the average concentration in the effluent and the average concentration in the influent, removal efficiency was 93.5%. A 93% removal of an influent having 560 µg/l results in an effluent concentration of 39 µg/. A 96% removal of the same influent would result in 22 µg/l in the effluent. Is this efficiency sufficient combined with mixing of the RO and UF water to meet the effluent goal of ≤ 7 µg/l? It would be informative if the origin of these assumptions was discussed more completely. The text should be revised accordingly.*

Response: Table 3-1 shows effluent selenium concentration target to be <=7 ug/L with an assumed 95% selenium removal through the FBR. This value is based on a plant influent selenium concentration of 125 ug/L and an RO concentration factor of 4. The Influent to the FBR unit for the calculation is 500 ug/L and the RO removal rate for selenium is estimated at 99.5%. The calculated selenium concentration of the combined flows is 6.7 ug/L based on these parameters. Three variables apply to the combined flow concentration: 1) Influent selenium concentration, 2) RO removal rate, and 3) FBR removal rate. As these variables are not fixed, an exact value for the projected selenium concentration from the pilot treatment system combined flows will be determined during the pilot operations.

AC-2 ***Section 6.2.3, Page 47:*** *It is not clear why there is a proposal to collect 5 grab samples and then composite them. Is there an issue with the homogeneity of the waste stream? If this is the issue, then a detailed discussion stating how the proposed number of samples will address such heterogeneity should be included the document.*

Response: There is not an issue with the homogeneity of the waste stream. Instead, the protocol to collect five grab samples, and then composite them, follows Standard Operating Procedure (SOP) No. 14 (Sediment Sampling for Chemical Analyses) as cited in the second paragraph of Section 6.2.3. Sample collection and related documentation will follow the full set of SOPs (see Appendix B). The text has been revised to cite SOP No. 14 earlier in the paragraph containing the statement referenced in this comment.

AC-3 ***Appendix D, Summary Report:*** *The design basis concentration of 0.1 mg/l is approximately 10x less than the methods being used for measuring sulfide (<1.0 mg/l). However, there are other methods for measuring sulfide at concentrations < 1 mg/l. This is important because the analytical method used should be one that has applicability at a range that captures the targeted concentration, i.e. < 1.0 mg/l. Future analysis should consider a different method than SM4500-S-F.*

Response: This comment refers to the Phase 1 design basis listed as <0.1 mg/L for sulfide, which is discussed in Appendix D of the Phase 2 Work Plan/SAP. However, the Phase 2 Work Plan/SAP presents an updated design basis of <1 mg/L sulfide (see Table 3-1), thus the reporting limit of 1 mg/L (see Tables 3-9 and 3-10) is now consistent with the design basis.

AC-4 ***Section 3.1.9, Page 25, 2nd paragraph:*** *This reviewer questions the word "wasted" in regards to waste activated sludge that is sent to the sludge thickener tank.*

Response: The term "wasted" has been replaced with "removed" in the cited text. For consistency within the document, the same change has been made in Sections 2.3.4 and 3.1.